ABSTRACT

In the Air Standard model for any Internal Combustion Engine it is assumed that the Air/Fuel Mixture combusts instantaneously and the thermal energy is delivered immediately. However in real world applications a certain amount of time is needed for the reactants to combust. Therefore, as the reactants combust more rapidly, the performance of the engine approaches the Air Standard Model. In an Internal Combustion Engine which burns petroleum based fuel, a catalytic coating of platinum in the combustion chamber will cause the A/F mixture to burn more rapidly and causing the flames speed to increase. This will increase the Internal Combustion Engine's Mean Effective Pressure (MEP). This rapid burning of the reactants (A/F mixture) brings Internal Combustion Engines closer to the Air Standard Otto Cycle, the Air Standard Diesel Cycle, and the Air Standard Duel Cycle in Piston Engines and the Air Standard Brayton Cycle in Gas Turbine Engines.

Because the catalyst actually lowers the activation energy of the reactants (Air/Fuel mixture) the incidents of Piston Engines "missing" and "flameout" in Gas Turbine Engines will be reduced.

In Spark Ignition Engines, because fuel will burn more rapidly the "unburned mixture" which can ignite and cause knocking will have less time to ignite before they are consumed by the flame front. Because of the increase in flame speed a greater percentage of the A/F will be converted into carbon dioxide and water, less "unburned mixture" will be left over from the exhaust stroke to cause knocking.